

What is claimed is:

- sub
C1
- 6667E0" 267E2260
1. A hybrid fiber/coax network, comprising:
a head end;
5 at least one optical distribution node coupled to the head end over at least one fiber optic link,
a plurality of coaxial cable links coupled to each of the at least one optical distribution node;
a transmitter, disposed at the optical distribution node, that is responsive to
10 signals from the plurality of coaxial cable links, that converts analog signals to baseband digital signals and that transmits the baseband digital signals to the head end over the at least one optical link; and
a receiver, disposed at the head end, that is responsive to the baseband digital signals from the transmitter and that converts the digital signals to analog signals for the
15 head end.
 2. The network of claim 1, wherein the transmitter includes a analog to digital converter that is operable to generate at least 850 Megabits per second.
 - 20 3. The network of claim 1, wherein the transmitter separately converts signals from the plurality of coaxial cables into separate, n-bit signals, and combines the separate n-bit signals into a serial data stream.
 4. The network of claim 1, wherein the transmitter incorporates data from a status
25 monitor in the baseband digital signal transmitted to the head end.
 5. The network of claim 1, wherein the transmitter incorporates bit error rate link performance data into the baseband digital signal transmitted to the head end.

6. The network of claim 1, wherein the transmitter combines signals from the plurality of coaxial cables prior to converting the signals to baseband digital signals.
7. A transmitter for an optical distribution node, the transmitter comprising:
 - 5 at least one bandpass filter that is operable to select a portion of the frequency spectrum that is associated with return path signals for a hybrid fiber/coax network;
 - at least one analog to digital converter, responsive to the at least one bandpass filter, that creates baseband digital data from the return path signals;
 - at least one multiplexer, responsive to the at least one analog to digital converter,
 - 10 that creates a serial data stream from the baseband digital data from the at least one analog to digital converter; and
 - an optical transmitter, responsive to the at least one multiplexer, that is operable to transmit the serial data stream to a head end as a digital baseband signal.
- 15 8. The transmitter of claim 7, and further including a monitor that monitors the operation of the optical distribution node and that creates status data for transmission to a head end in the serial data stream.
9. The transmitter of claim 7, wherein the bandpass filter include a pass band in the
20 range from 5 to 42 MHZ.
10. The transmitter of claim 7, wherein the at least one analog to digital converter includes one analog to digital converter for each coaxial link associated with the transmitter.
25
11. The transmitter of claim 7, wherein the at least one multiplexer comprises:
 - one first stage multiplexer for each coaxial link associated with the transmitter;
 - and
 - an additional multiplexer coupled to the output of each of the first stage
 - 30 multiplexers.

12. The transmitter of claim 7, and further including bit error rate link performance data that is coupled to the at least one multiplexer to be included in the serial data stream.

5 13. A method for processing data in a return path of a hybrid fiber/coax network, the method comprising:

receiving analog, upstream data at an optical distribution node;

generating baseband digital data from the analog, upstream data;

creating a serial data stream including the digital data; and

10 driving a digital laser to transmit the digital data in a baseband digital format to a head end of the network.

14. The method of claim 13, wherein generating digital data comprises sampling the analog, upstream data at a rate of at least 850 Megabits per second.

15 15. The method of claim 13, wherein creating the digital data stream comprises multiplexing at least one n-bit digital data stream into a serial data stream.

20 16. The method of claim 13, wherein creating the digital data stream comprises multiplexing a number of n-bit digital data streams into a serial data stream.

17. The method of claim 13, wherein receiving analog, upstream data at an optical distribution node comprises receiving analog, upstream data from a number of coaxial links.

25

18. A receiver for a digital data return path of a head end in a hybrid fiber/coax network, the receiver comprising:

an optical receiver that is operable to receive a serial, digital baseband signal from an optical link;

at least one demultiplexer, responsive to the optical receiver, that demultiplexes the digital baseband signal;

at least one digital to analog converter, responsive to the at least one demultiplexer, that creates analog signals for the head end; and

5

at least one filter that is operable to compensate for quantization effects in the frequency spectrum that is associated with return path signals for a hybrid fiber/coax network.

10 19. The receiver of claim 18, wherein the at least one demultiplexer removes status data for the head end from the serial baseband signal.

20. The receiver of claim 18, wherein the at least one digital to analog converter includes one digital to analog converter for each coaxial link associated with the
15 receiver.

21. The receiver of claim 18, wherein the at least one demultiplexer comprises:
one first stage demultiplexer for each coaxial link associated with the receiver;
and
20 an additional demultiplexer coupled to the output of each of the first stage demultiplexers.

22. The receiver of claim 18, wherein the at least one demultiplexer removes bit error rate data from the serial baseband signal.

25